

ORIGIN DEVICE BASED CALLER IDENTIFICATION**CROSS-REFERENCE TO RELATED APPLICATIONS**

5

The present application is related to the following co-pending applications:

(1) U.S. Patent Application Serial No. ____/____ (Attorney
Docket No. AUS920010819US1);

(2) U.S. Patent Application Serial No. ____/____ (Attorney
Docket No. AUS920010820US1);

(3) U.S. Patent Application Serial No. ____/____ (Attorney
Docket No. AUS920010821US1);

(4) U.S. Patent Application Serial No. ____/____ (Attorney
Docket No. AUS920010822US1); and

(5) U.S. Patent Application Serial No. ____/____ (Attorney
Docket No. AUS920010823US1).

BACKGROUND OF THE INVENTION

1. Technical Field:

5

The present invention relates in general to telecommunications and, in particular, to voice identification. Still more particularly, the present invention relates to initiating authentication of the identity of a caller at an origin device.

2. Description of the Related Art:

Telephone service has created communication channels worldwide, and those channels continue to expand with the advent of cellular and other wireless services. A person can simply take a telephone off-hook and dial a destination number or press a send button and be connected to a telephone line around the world.

20

25

Today, the public switching telephone network (PSTN), wireless networks, and private networks telephone services are based on the identification of the wireless telephone or wireline that a calling party uses. Services are personalized according to wireless telephone or wireline telephone number, where services associated with one telephone number are not accessible for another telephone number assigned to the same subscriber. For example, there is typically a first set of service features and billing options assigned to a home line number, a second set

of service features and billing options assigned to an office line number, and a third set of service features and billing options assigned to a cellular telephone number. The networks process calls to and from each of these different subscriber
5 telephones based on a separate telephone number.

A problem arises when a caller needs to access a service provided to one telephone number from another telephone number. Further, a problem arises when two or more persons utilize a single line, but each prefers different sets of service options.

10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
120
125
130
135
140
145
150
155
160
165
170
175
180
185
190
195
200
205
210
215
220
225
230
235
240
245
250
255
260
265
270
275
280
285
290
295
300
305
310
315
320
325
330
335
340
345
350
355
360
365
370
375
380
385
390
395
400
405
410
415
420
425
430
435
440
445
450
455
460
465
470
475
480
485
490
495
500
505
510
515
520
525
530
535
540
545
550
555
560
565
570
575
580
585
590
595
600
605
610
615
620
625
630
635
640
645
650
655
660
665
670
675
680
685
690
695
700
705
710
715
720
725
730
735
740
745
750
755
760
765
770
775
780
785
790
795
800
805
810
815
820
825
830
835
840
845
850
855
860
865
870
875
880
885
890
895
900
905
910
915
920
925
930
935
940
945
950
955
960
965
970
975
980
985
990
995

One of the services provided by many networks is caller identification. However, caller identification (caller ID) is limited to identification of the wireline or wireless telephone number and the name of the subscriber of a service. Where multiple people share a single line, only the name of the person who establishes a service (the line subscriber) is displayed as the caller ID, often causing confusion about who is actually
20 calling.

Another problem with caller identification is that a caller's phone number is revealed, in cases where the caller does not want a number revealed. Therefore, another service provided
25 by many networks is caller ID blocking. Caller ID blocking service blocks a caller ID of the line from which a call is made from passing to a device receiving a call. Telemarketing companies and other solicitation callers are among those who often block a caller ID.

Therefore, in view of the foregoing, it would be advantageous to provide a method, system, and program for identifying a call according to the identity of caller, rather than the number for the wireline or wireless service from which a call is made. In addition, it would be advantageous to provide a method, system, and program for specifying services available to a caller at any telephony device, rather than just those devices for which the caller is a subscriber.

SUMMARY OF THE INVENTION

In view of the foregoing, it is therefore an object of the present invention to provide an improved telecommunications system.

It is another object of the present invention to provide a method, system and program for improved voice identification.

It is yet another object of the present invention to provide a method, system and program for initiating authentication of the identity of a caller at an origin device.

According to one aspect of the present invention, a voice utterance is detected at an origin device. A caller identity associated with the voice utterance is identified at the origin device, such that the caller identity is transmittable as an authenticated identity of the caller for a call.

According to another aspect of the present invention, a call request is received at an intermediary device, with an authenticated caller identity from an origin device. A caller profile for the authenticated caller identity is retrieved. A selection of services from among multiple available services are offered for the call request according to the caller profile.

All objects, features, and advantages of the present invention will become apparent in the following detailed written

description.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
946
947
948
949
950
951
952
953
954
955
956
957
958
959
960
961
962
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999
1000
1001
1002
1003
1004
1005
1006
1007
1008
1009
1010
1011
1012
1013
1014
1015
1016
1017
1018
1019
1020
1021
1022
1023
1024
1025
1026
1027
1028
1029
1030
1031
1032
1033
1034
1035
1036
1037
1038
1039
1040
1041
1042
1043
1044
1045
1046
1047
1048
1049
1050
1051
1052
1053
1054
1055
1056
1057
1058
1059
1060
1061
1062
1063
1064
1065
1066
1067
1068
1069
1070
1071
1072
1073
1074
1075
1076
1077
1078
1079
1080
1081
1082
1083
1084
1085
1086
1087
1088
1089
1090
1091
1092
1093
1094
1095
1096
1097
1098
1099
1100
1101
1102
1103
1104
1105
1106
1107
1108
1109
1110
1111
1112
1113
1114
1115
1116
1117
1118
1119
1120
1121
1122
1123
1124
1125
1126
1127
1128
1129
1130
1131
1132
1133
1134
1135
1136
1137
1138
1139
1140
1141
1142
1143
1144
1145
1146
1147
1148
1149
1150
1151
1152
1153
1154
1155
1156
1157
1158
1159
1160
1161
1162
1163
1164
1165
1166
1167
1168
1169
1170
1171
1172
1173
1174
1175
1176
1177
1178
1179
1180
1181
1182
1183
1184
1185
1186
1187
1188
1189
1190
1191
1192
1193
1194
1195
1196
1197
1198
1199
1200
1201
1202
1203
1204
1205
1206
1207
1208
1209
1210
1211
1212
1213
1214
1215
1216
1217
1218
1219
1220
1221
1222
1223
1224
1225
1226
1227
1228
1229
1230
1231
1232
1233
1234
1235
1236
1237
1238
1239
1240
1241
1242
1243
1244
1245
1246
1247
1248
1249
1250
1251
1252
1253
1254
1255
1256
1257
1258
1259
1260
1261
1262
1263
1264
1265
1266
1267
1268
1269
1270
1271
1272
1273
1274
1275
1276
1277
1278
1279
1280
1281
1282
1283
1284
1285
1286
1287
1288
1289
1290
1291
1292
1293
1294
1295
1296
1297
1298
1299
1300
1301
1302
1303
1304
1305
1306
1307
1308
1309
1310
1311
1312
1313
1314
1315
1316
1317
1318
1319
1320
1321
1322
1323
1324
1325
1326
1327
1328
1329
1330
1331
1332
1333
1334
1335
1336
1337
1338
1339
1340
1341
1342
1343
1344
1345
1346
1347
1348
1349
1350
1351
1352
1353
1354
1355
1356
1357
1358
1359
1360
1361
1362
1363
1364
1365
1366
1367
1368
1369
1370
1371
1372
1373
1374
1375
1376
1377
1378
1379
1380
1381
1382
1383
1384
1385
1386
1387
1388
1389
1390
1391
1392
1393
1394
1395
1396
1397
1398
1399
1400
1401
1402
1403
1404
1405
1406
1407
1408
1409
1410
1411
1412
1413
1414
1415
1416
1417
1418
1419
1420
1421
1422
1423
1424
1425
1426
1427
1428
1429
1430
1431
1432
1433
1434
1435
1436
1437
1438
1439
1440
1441
1442
1443
1444
1445
1446
1447
1448
1449
1450
1451
1452
1453
1454
1455
1456
1457
1458
1459
1460
1461
1462
1463
1464
1465
1466
1467
1468
1469
1470
1471
1472
1473
1474
1475
1476
1477
1478
1479
1480
1481
1482
1483
1484
1485
1486
1487
1488
1489
1490
1491
1492
1493
1494
1495
1496
1497
1498
1499
1500
1501
1502
1503
1504
1505
1506
1507
1508
1509
1510
1511
1512
1513
1514
1515
1516
1517
1518
1519
1520
1521
1522
1523
1524
1525
1526
1527
1528
1529
1530
1531
1532
1533
1534
1535
1536
1537
1538
1539
1540
1541
1542
1543
1544
1545
1546
1547
1548
1549
1550
1551
1552
1553
1554
1555
1556
1557
1558
1559
1560
1561
1562
1563
1564
1565
1566
1567
1568
1569
1570
1571
1572
1573
1574
1575
1576
1577
1578
1579
1580
1581
1582
1583
1584
1585
1586
1587
1588
1589
1590
1591
1592
1593
1594
1595
1596
1597
1598
1599
1600
1601
1602
1603
1604
1605
1606
1607
1608
1609
1610
1611
1612
1613
1614
1615
1616
1617
1618
1619
1620
1621
1622
1623
1624
1625
1626
1627
1628
1629
1630
1631
1632
1633
1634
1635
1636
1637
1638
1639
1640
1641
1642
1643
1644
1645
1646
1647
1648
1649
1650
1651
1652
1653
1654
1655
1656
1657
1658
1659
1660
1661
1662
1663
1664
1665
1666
1667
1668
1669
1670
1671
1672
1673
1674
1675
1676
1677
1678
1679
1680
1681
1682
1683
1684
1685
1686
1687
1688
1689
1690
1691
1692
1693
1694
1695
1696
1697
1698
1699
1700
1701
1702
1703
1704
1705
1706
1707
1708
1709
1710
1711
1712
1713
1714
1715
1716
1717
1718
1719
1720
1721
1722
1723
1724
1725
1726
1727
1728
1729
1730
1731
1732
1733
1734
1735
1736
1737
1738
1739
1740
1741
1742
1743
1744
1745
1746
1747
1748
1749
1750
1751
1752
1753
1754
1755
1756
1757
1758
1759
1760
1761
1762
1763
1764
1765
1766
1767
1768
1769
1770
1771
1772
1773
1774
1775
1776
1777
1778
1779
1780
1781
1782
1783
1784
1785
1786
1787
1788
1789
1790
1791
1792
1793
1794
1795
1796
1797
1798
1799
1800
1801
1802
1803
1804
1805
1806
1807
1808
1809
1810
1811
1812
1813
1814
1815
1816
1817
1818
1819
1820
1821
1822
1823
1824
1825
1826
1827
1828
1829
1830
1831
1832
1833
1834
1835
1836
1837
1838
1839
1840
1841
1842
1843
1844
1845
1846
1847
1848
1849
1850
1851
1852
1853
1854
1855
1856
1857
1858
1859
1860
1861
1862
1863
1864
1865
1866
1867
1868
1869
1870
1871
1872
1873
1874
1875
1876
1877
1878
1879
1880
1881
1882
1883
1884
1885
1886
1887
1888
1889
1890
1891
1892
1893
1894
1895
1896
1897
1898
1899
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
2051
2052
2053
2054
2055
2056
2057
2058
2059
2060
2061
2062
2063
2064
2065
2066
2067
2068
2069
2070
2071
2072
2073
2074
2075
2076
2077
2078
2079
2080
2081
2082
2083
2084
2085
2086
2087
2088
2089
2090
2091
2092
2093
2094
2095
2096
2097
2098
2099
2100
2101
2102
2103
2104
2105
2106
2107
2108
2109
2110
2111
2112
2113
2114
2115
2116
2117
2118
2119
2120
2121
2122
2123
2124
2125
2126
2127
2128
2129
2130
2131
2132
2133
2134
2135
2136
2137
2138
2139
2140
2141
2142
2143
2144
2145
2146
2147
2148
2149
2150
2151
2152
2153
2154
2155
2156
2157
2158
2159
2160
2161
2162
2163
2164
2165
2166
2167
2168
2169
2170
2171
2172
2173
2174
2175
2176
2177
2178
2179
2180
2181
2182
2183
2184
2185
2186
2187
2188
2189
2190
2191
2192
2193
2194
2195
2196
2197
2198
2199
2200
2201
2202
2203
2204
2205
2206
2207
2208
2209
2210
2211
2212
2213
2214
2215
2216
2217
2218
2219
2220
2221
2222
2223
2224
2225
2226

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself
5 however, as well as a preferred mode of use, further objects and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

Figure 1 depicts a block diagram of a network environment in which the present invention may be implemented;

Figure 2 illustrates a block diagram of the flow of a voice identifier authenticated by an origin device in accordance with the method, system, and program of the present invention;

Figure 3 depicts a block diagram of the flow of a voice identifier authenticated by a third party device accessible from an origin device in accordance with the method, system, and
20 program of the present invention;

Figure 4 illustrates a flow diagram of a signal flow and processing where an origin device authenticates a caller identity in accordance with the method, system, and program of the present
25 invention; and

THE **WORLD'S** **GREATEST** **LIBRARY**

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A method, system, and program for origin device initiated caller identification are provided. By authenticating a caller identity at an origin device, the caller identity may be transferred from the origin device to an intermediary device and destination device. The caller identity identifies the caller, rather than the line from which a call is made. An intermediary device may then utilize the caller identity to specify services available for a call, such that telephone lines are not limited to the services selected by the line subscriber. Further, a destination device may display the caller identity, such that the callee is notified of who is placing a call.

One advantage of origin device initiated caller identification includes performing caller identity authentication without requiring use of intermediary network resources. Another advantage of origin device initiated caller identification includes maintaining voice samples of callers at the origin device, rather than releasing the voice samples to an intermediary network.

Where needed, a third party server may be accessed by the origin device to aid in caller identity authentication. Authentication by a third party server allows the caller authenticated identity to be verified by an external source without use of intermediary network resources. In addition, a third party server may store voice samples independent of the origin devices, but in a trusted manner.

While in the present invention, authentication of a caller identity is described with emphasis placed on voice authentication, other methods of caller identity authentication may also be performed. Voice samples utilized for voice authentication are just one of multiple types of biometric sampling. For example, a caller may locally provide an eye scan, a fingerprint, and other biophysical identifiers that are transmitted within or outside the trusted network to authenticate the identity of the caller. Alternatively, keypad entries, such as a pin code, account number, password, or other secure transaction key may be entered by a caller and utilized to authenticate the identity of the caller.

In addition, while in the present invention, authentication of a caller identity is described with emphasis upon performing authentication at the beginning of a call, authentication of a caller identity may be performed continuously throughout a call, at selected points throughout a call, and after a call. Selected points where authentication may be performed include when an additional phone pick-up is detected, when a new voice is detected at the origin device, when a call is transferred from one telephone device to another, and other routing of a call that may result in a new caller or in a call being recorded.

Further, while the present invention is described with emphasis upon a caller identity authentication being made for a call to continue, a call may also continue without caller identity authentication. However, where a caller is not

identifiable, it may be advantageous to automatically log that the caller lacks proper identification and automatically record calls that lack proper caller identification.

5 For purposes of the present invention, telephony devices are termed origin devices when utilized for origination of a call to an intermediary device and are termed destination devices when utilized for receipt of a call from an intermediary device. Subscribers to a call are termed callers when originating a call and are termed callees when receiving a call. Callers and callees may or may not be line subscribers to the particular telephony device utilized.

10 In the following description, for the purposes of explanation, numerous specific details are set forth to provide a thorough understanding of the present invention. It will be apparent, however, to one skilled in the art that the present invention may be practiced without these specific details. In other instances, well-known structures and devices are shown in
15 block diagram form to avoid unnecessarily obscuring the present invention.
20

25 With reference now to the figures, and, in particular, with reference now to **Figure 1**, there is depicted a block diagram of a network environment in which the present invention may be implemented. While the present invention is described with reference to one type of network environment, it will be understood by one with skill in the art that the present invention may be implemented in alternate types of network

environments.

GENERAL NETWORK ENVIRONMENT

5 First, the network environment incorporates a Public Switching Telephone Network (PSTN) **10**. As is known in the art the core of PSTN **10** may include multiple telephone networks, each owned by one of multiple independent service providers. Each telephone line is carried by an independent service provider within PSTN **10** and is typically assigned to at least one subscriber.

Switching of a call within an independent service provider's telephone network is considered trusted movement within a trusted network because the call remains within the company's telephone network infrastructure. However, calls may be transferred from one service provider's telephone network to another service provider's telephone network in generally trusted movement. Generally, service providers are in competition with one another and therefore there is general trust in transferring a call, but not trust in sharing of subscriber information beyond a subscriber number and name from one service provider to the next without security features or other arrangements.

25 Advantageously, each telephone network within PSTN **10** may access a data network functioning as an extension to PSTN **10** via an Intranet. Data networks may include, for example, subscriber profiles, billing information, and preferences that are utilized by a service provider to specialize services. Transfer of

information between a service provider's data network and telephone network is trusted movement in sharing of information.

Further, each telephone network within PSTN **10** may access
5 server systems external to PSTN **10** in the Internet Protocol over the Internet or an Intranet. Such external server systems may include an enterprise server, an Internet service provider (ISP), an access service provider (ASP), a personal computer, and other computing systems that are accessible via a network. In the present embodiment, transfer of information between PSTN **10** and server systems accessible via network **20** is totally untrusted and therefore may require authentication and additional security.

In the present invention, network **20** may comprise a private network, Intranet, or a public Internet Protocol network. Specifically, telco application server **22**, generic application server **24**, pervasive application server **26**, and systems management server **28** represent server systems external to PSTN **10** that may be accessed by PSTN **10** over network **20**.

In particular, telco application server **22** preferably includes multiple telco specific service applications for providing services to calls transferred to a server external to PSTN **10**. In particular, a call may be transferred from PSTN **10**
25 to telco application server **22** to receive at least one service and then the call is transferred back to PSTN **10**. Such services may also be provided to calls within PSTN **10**, however placing such services at a third party such as telco application server

22, is advantageous because adding services and information to PSTN **10** is time consuming and costly when compared with the time and cost of adding the services through telco application server **22**.

5

In accord with an advantage of the present invention, as will be further described, the identity of both the caller and the callee may be authenticated by one of telephony devices **8a-8n**, PSTN **10**, or by telco application server **22**. By authenticating the actual identity of the person making a phone call and the person receiving the phone call, rather than the identification of a device from which a call is made and received, an enhanced specialization of services to subscribers may be performed.

An authentication service within telco application server **22** may include identification and verification of the identity of a caller and/or callee of a particular call. Such a service may require that subscribers provide voice samples when setting up a subscription. The stored voice samples may then be compared against voice samples received for a particular call in order to authenticate the identity of a current caller or callee of the particular call.

Generic application server **24** preferably accesses independent server systems that provide services. For example, a messaging server, a financial server, an Internal Revenue Service (IRS) server, and database management system (DBMS) server may be accessed in HTTP via network **20**. Each of these servers may

include a telco service application that requires authentication of the subscriber before access is granted. For example, a financial server may provide a telco service application that allows an authenticated subscriber to access current financial records and request stock quotes from the financial server.

Pervasive application server **26** manages services for wirelessly networked devices. In particular, pervasive application server **26** preferably handles distribution of wireless packets of voice and data to wirelessly networked devices utilizing a standard such as short messaging service (SMS) messaging or other 3G standards.

Systems management server **28** manages subscriber personalization via the web. In particular, systems management server **28** includes browser technology that includes a provisioning console **30** for establishing a subscriber profile and a management console **32** for managing and updating the subscriber profile. A subscriber preferably accesses the consoles of systems management server **28** via the Internet utilizing a computing system, such as computing systems **34a-34n**.

The subscriber profile may be accessed at systems management server **28** by other external servers and PSTN **10** via network **20**. In addition, a local copy of a subscriber profile updated in systems management server **28** may be stored within a particular service provider's data network or telephone network. Each service provider may specify the types of preferences and other information included within a subscriber profile.

In particular, a subscriber may provide a voice imprint when establishing a subscriber profile through provisioning console

30. Other types of authentication information may also be
5 provided including, but not limited to, a password, an eye scan, a smart card ID, and other security devices. In addition, a subscriber may designate billing preferences, shopping preferences, buddy list preferences, and other preferences that enable specialized service to the subscriber when the subscriber's identity is authenticated from the voice imprint or other identification.

Advantageously, a management agent is built into each external server to monitor the services provided by each server according to the authenticated subscriber receiving the services. By monitoring service output according to subscriber, the subscriber may then be billed according to each use of a service.

PSTN 10 preferably includes both voice and data signaling
20 networks that interface with network 20 via gateways. Each of the gateways acts as a switch between PSTN 10 and network 20 that may compress a signal, convert the signal into Internet Protocol (other protocol) packets, and route the packets through network 20 to the appropriate server.

25 In particular, the voice network interfaces with network 20 through media gateway 14 which supports multiple protocol gateways including, but not limited to, SIP. SIP is a signaling protocol for Internet conferencing, telephony, presence, events

notification and instant messaging.

In addition, in particular, the data signaling network interfaces with network **20** through signaling gateway **12** which supports multiple protocol gateways including, but not limited to, parlay protocol gateways and SS7 protocol gateways. Internet servers, such as telco application server **22** may include protocol agents that are enabled to interact with multiple protocols encapsulated in Internet Protocol packets including, but not limited to, SS7 protocol, parlay protocol, and SIP.

IDENTITY AUTHENTICATION AND CALL CONTROL

Looking into PSTN **10**, a telephone network typically includes multiple switches, such as central office switches **11a-11n**, that originate, terminate, or tandem calls. Central office switches **11a-11n** utilize voice trunks for transferring voice communications and signaling links for transferring signals between signaling points.

Between signaling points, one central office switch sends signaling messages to other central office switches via signaling links to setup, manage, and release voice circuits required to complete a call. In addition, between signaling points, central office switches **11a-11n** query service control points (SCPs) **15** to determine how to route a call. SCPs **15** send a response to the originating central office switch containing the routing number(s) associated with the dialed number.

SCPs **15** may be general purpose computers storing databases of call processing information. While in the present embodiment SCPs **15** are depicted locally within PSTN **10**, in alternate embodiments SCPs **15** may be part of an extended network accessible to PSTN **10** via a network.

One of the functions performed by SCPs **15** is processing calls to and from various subscribers. For example, an SCP may store a record of the services purchased by a subscriber, such as a privacy service. When a call is made to the subscriber, the SCP provides record of the privacy service to initiate an announcement to a caller to identify themselves to the subscriber with the privacy service who is being called. According to an advantage of the invention, authentication of the subscriber receiving the call may be required before the privacy service is initiated for that subscriber.

In particular, network traffic between signaling points may be routed via a packet switch called a service transfer point (STP) **13**. STP **13** routes each incoming message to an outgoing signaling link based on routing information. Further, in particular, the signaling network may utilize an SS7 network implementing SS7 protocol.

Central office switches **11a-11n** may also send voice and signaling messages to intelligent peripherals (IP) **17** via voice trunks and signaling channels. IP **17** provides enhanced announcements, enhanced digit collection, and enhanced speech recognition capabilities.

According to an advantage of the present invention, the identity of a caller is authenticated according to voice authentication. Voice authentication is preferably performed by first identifying a subscriber by matching the name or other identifier spoken with a subscriber name or identifier. Next, voice authentication requires verifying that the voice audio signal matches that of the identified subscriber. However, in alternate embodiments, the identity of a subscriber may be authenticated according to passwords, eye scans, encryption, and other biometric and keyed entries.

In particular, to perform subscriber authentication of audio signals received from callers, IP **17** may include storage for subscriber specific templates or voice feature information, for use in authenticating subscribers based on speech. If a subscriber specific template is not stored on a local IP **17**, then a remote IP containing the subscriber specific template may be accessed via a network. In addition, local IP **17** may access systems management server **28** or another repository for voice imprints to access the subscriber specific template.

Where IP **17** authenticates the identity of a caller (e.g. the subscriber placing a call), a voice identifier (VID) representing the authenticated caller identity is transferred as a signal for identifying the caller. In addition, where IP **17** authenticates the identity of a callee (e.g. the subscriber receiving a call), a reverse VID (RVID) including the callee identity is transferred as a signal for identifying the callee.

Advantageously, VIDs indicate through text, voice, or video the identity of a caller. For example, a caller's name may be transferred as the identity of a caller. Alternatively, a video clip stored with the subscriber template may be transferred as the identity of a caller. Additionally, VIDs may indicate the identity of the device utilized by a caller to provide context for a call. Further, VIDs may indicate which system or systems have authenticated the caller identity.

After a VID and/or RVID are determined by IP **17**, IP **17** and SCP **15** may communicate to designate which services are available according to VID and RVID. Advantageously, by designating services according to a VID and/or RVID, subscribers are provided with services and billed for those services independent of the devices utilized by subscribers. In particular, a 1129 protocol or other protocol may be utilized to enable signal communications between IP **17** and SCPs **15**. In addition, as previously described, caller authentication to determine VIDs and RVIDs may be performed by a third party, such as telco application server **22**.

An origin telephony device or destination telephony device may also determine a VID and/or RVID for the caller and/or callee of a call. In particular, telephony devices **8a-8n** and call centers **16a-16n** may function as origin and designation telephony devices. Each of the telephony devices may include a database of voice templates that may be utilized to authenticate the identity of a caller or callee. In addition, each of the telephony devices may access a third party, such as telco application

server **22**, to authenticate the identity of the caller or callee.

In either case, the telephony device transmits a VID and/or RVID with a call to PSTN **10**.

5 Telephony devices **8a-8n** may include, but are not limited to wireline devices, wireless devices, pervasive device equipped with telephony features, a network computer, a facsimile, a modem, and other devices enabled for network communication. Advantageously, as previously described, a voice authentication
10 functioning device may be included in each of telephony devices **8a-8n**.

15 However, in addition to authentication according to voice identification and recognition, telephony devices **8a-8n** may be equipped to receive other biometric type input. For example, telephony devices **8a-8n** include an eye print scanner, a fingerprint scanner, and other devices that detect individual human characteristics. Preferably, telephony devices **8a-8n** may receive these other types of biometric input and compare other
20 types of biometric input with previous recorded samples to determine the identity of a caller.

25 In addition, telephony devices **8a-8n** may each incorporate a display that provides a visual output of a VID or RVID. Alternatively, such a display may be provided in a separate device connected to the line in parallel to telephones **8a-8n**. According to one advantage of the present invention, the identity of the actual caller or actual callee are output to a display in association with a call. In addition, other context information

about the caller including, but not limited to, the device from which the call originates or is answered, ratings for a caller or callee, and other context information may be output to a display in association with a call.

5

Telephony devices **8a-8n** are communicatively connected to PSTN **10** via wireline, wireless, ISDN, and other communication links. Preferably, connections to telephony devices **8a-8n** provide digital transport for two-way voice grade type telephone communications and a channel transporting signaling data messages in both directions between telephony devices **8a-8n** and PSTN **10**.

In addition to telephony devices **8a-8n**, advanced telephone systems, such as call centers **16a-16n**, may be communicatively connected to PSTN **10** via wireline, wireless, ISDN and other communication links. Call centers **16a-16n** may include PBX systems, hold queue systems, private network systems, and other systems that are implemented to handle distribution of calls to multiple representatives or agents.

20

Returning to central office switches **11a-11n**, typically, one central office switch exists for each exchange or area served by the NXX digits of an NXX-XXXX (seven digit) telephone number or the three digits following the area code digits (NPA) in a ten-digit telephone number. The service provider owning a central office switch also assigns a telephone number to each line connected to each of central office switches **11a-11n**. The assigned telephone number includes the area code (NPA) and exchange code (NXX) for the serving central office and four

25

unique digits (XXXX).

Central office switches **11a-11n** utilize office equipment (OE) numbers to identify specific equipment, such as physical links or circuit connections. For example, a subscriber's line might terminate on a pair of terminals on the main distribution frame of one of central office switches **11a-11n**. The switch identifies the terminals, and therefore a particular line, by an OE number assigned to that terminal pair. For a variety of reasons, a service provider may assign different telephone numbers to the one line at the same or different times. For example, a local carrier may change the telephone number because a subscriber sells a house and a new subscriber moves in and receives a new number. However, the OE number for the terminals and thus the line itself remains the same.

On a normal call, a central office switch will detect an off-hook condition on a line and provide a dial tone. The switch identifies the line by the OE number. The central office switch retrieves profile information corresponding to the OE number and off-hook line. Then, the central office switch receives the dialed digits from the off-hook line terminal and routes the call. The central office switch may route the call over trunks and possibly through one or more central office switches to the central office switch that serves the called party's station or line. The switch terminating a call to a destination will also utilize profile information relating to the destination, for example to forward the call if appropriate, to apply distinctive ringing, etc.

In the present invention, when a central office switch detects an off-hook condition on a line, the central office switch will then determine if a VID signal is transferred from the off-hook telephony device. If a VID is transferred, then a query is made to SCP **15** according to the VID for any services specified for the authenticated subscriber. Alternatively, a query may be transferred via network **20** to an external server, such as system management server **28**, to determine the services specified for the caller. The central office switch will then receive the dialed digits from the off-hook line terminal and route the call, providing services according to those preferred by the authenticated subscriber.

In addition, an RVID may be provided in the present invention to authenticate the identity of a callee receiving the call. When a call is answered, the call is transferred back to an IP or telco application server **22** to authenticate the identity of the callee answering the call.

As another alternative to dialed digits from the off-hook line terminal, a caller may utilize a voice calling function of a telephony device for indicating how the call should be routed. For example, a caller may say the name of a preferred callee. The device or IP **17** may determine a person within the caller's calling list that matches the voiced name. The matching person's digits are then utilized to route the call.

VID AUTHENTICATION CONTEXT

Referring now to **Figure 2**, there is illustrated a block diagram of the flow of a voice identifier authenticated by an origin device in accordance with the method, system, and program
5 of the present invention.

As depicted, an origin device **40** authenticates a VID for a current caller. In particular, origin device **40** may include a caller telephony device, as previously described. However, origin device **40** may also include a PBX, call center or other private switching system that manage multiple telephony devices. Moreover, origin device **40** may include network servers, feature servers, and other systems which provide call origination.

A service identification/verification (SIV) **41** feature within origin device **40** may determine the identity of a caller and authenticate that identity by comparing a voice utterance made by a caller with a database of voice samples stored in a voice sample database **49** within origin device **40**. The voice
20 utterance may include, for example, the caller's name and the caller's service provider. In addition, SIV **41** may continue to monitor and authenticate the caller identity throughout the call, at a periodic rate and/or in response to triggers.

A VID authenticated by origin device **40** is preferably transmitted to an intermediary device **42**. In particular, intermediary device **42** may include a PSTN switching network. However, intermediary device **42** may also include a PBX, call center or other private switching system. Moreover, intermediary
25

device **42** may include network servers, telco application servers, Websphere7 servers (Websphere7 is a registered trademark of International Business Machines, Inc.), and other systems which provide call processing.

5

SIV feature **41** may also filter the VID according to recipient prior to transfer to intermediary device **42**. The VID is preferably filtered according to caller preferences, including blocking preferences and content selection preferences. For example, a caller may select to block the callee from receiving the VID. In another example, the caller may select to limit the information in the VID to the caller's last name. In addition, intermediary device **42** and destination device **44** may filter and record the VID.

Intermediary device **42** may utilize the VID to determine services available to a caller. Further, intermediary device **42** may utilize the VID to access a caller profile and other contextual information about a caller. Moreover, intermediary device **42** may prompt a caller to provide a voice utterance that may be analyzed to further authenticated the VID of the caller.

Intermediary device **42** connects origin device **40** with a destination device **44**. In particular, destination device **44** may include a callee telephony device, as previously described. However, destination device **44** may also include a PBX, call center, or other private switching system that manages multiple telephony devices. Moreover, destination device **44** may include network servers, feature servers, client side devices, and other

systems which provide call receipt.

The authenticated VID is preferably transferred from intermediary device **42** to destination device **44** with a call.

- 5 Destination device **44** advantageously includes a display device or other output interface for output of the authenticated VID to the callee, such that the identity of the caller of an incoming call is provided to the callee.

In the present invention, a VID preferably authenticates the identity of a caller. However, it is advantageous that the VID also include other information that provide a context for a call.

For example, the GPS location or time zone of the caller location, the device from which the call is placed, the subject matter of the call, and whether the caller is calling on behalf of another, may be included in a VID. Further, the identity of the device that performed the caller authentication may be included in a VID.

- 20 A VID may be transferred in multiple protocols, including, but not limited to, Interface Definition Language (IDL). A VID may include a range of information, where each type of information may be tagged or identified in some other manner. For example, the following tagged VID may be transmitted to
25 represent an authenticated identity of a caller:

[name] Jon Smith

[device] Jane Doe's cell phone

[location] Central Time zone

[subject] Project A

[authenticated by] Jane Doe's cell phone

Destination device **44** may output all the information
5 included in a VID or a selection of the information. For
example, for the tagged VID described above, destination device
44 may output the following to an input/output interface
associated with destination device **44**:

AIncoming call from Jon Smith, using Jane Doe's cell phone,
in reference to Project A@

In addition, destination device **44** may interpret the
information included in a VID. For example, for the tagged VID
described above, destination device **44** may interpret the location
and output the following:

AIIt is currently 4:00 PM at Jon Smith's location@

20 Further, destination device **44** may perform other functions
with a VID. For example, destination device **44** may translate the
VID into a particular language. In addition, destination device
44 may request additional information for a VID from a third
party server.

25 With reference now to **Figure 3**, there is depicted a block
diagram of the flow of a voice identifier authenticated by a
third party device accessible from an origin device in accordance
with the method, system, and program of the present invention.

As illustrated, origin device **40** may access a third party device **46** with a request for VID authentication. Third party device **46** may include a telco application server, accessible via a network, that performs caller authentication. However, third party device **46** may also be a stand alone system or a server connected to a PBX, a private switching system, or a service provider switching system.

Third party device **46** may include a SIV **47** feature that receives a voice utterance from origin device **40** and authenticates an identity of a caller associated with the voice utterance by comparing the voice utterance with a database **50** of voice samples stored at third party device **46**. Third party device **46** then returns an VID containing the identity of the caller. Origin device **40** may add additional information to the VID to provide context for the call.

Alternatively, origin device **40** may access a database of voice samples stored at third party device **46**. Where origin device **40** requests voice samples from third party device **46**, origin device **40** may, for example, request a selection of voice samples for a name identified from a voice utterance. Origin device **40** then authenticates a VID for the caller according to the retrieved selection of voice samples.

Communications between origin device **40** and third party

device **46** may be facilitated by intermediary device **42**. In addition, communications between origin device **40** and third party device **46** may be facilitated by network **20**, such as the Internet, an Intranet, or a private networking service.

5

SIV **47** may implement levels of security in communications with origin device **40**. For example, a secure channel utilizing a secure socket layer may be implemented. In addition, other encryption techniques may be implemented for transfer of information.

In an example, a voice utterance provided by a caller may include a name and a service provider from which the caller receives service. Origin device **40** may then contact the third party service provider device **46** and request either an authentication of the voice utterance or voice samples for a name identified from the voice utterance. The third party service provider advantageously stores voice samples for each customer, such that identity authentication may be performed.

20

In another example, advantageously, voice sample database **49** within origin device **40** may include numerous voice samples of the callers who typically utilize origin device **40**. For example, numerous voice samples for members of a household may be stored at an origin device **40** for a household. However, where a caller not included in voice sample database **49** utilizes origin device **40**, the identity of the caller is preferably authenticated through the aid of third party device **46**. For example, where a

25

[illegible]

20

The caller lifts a handset creating an off-hook state in the origin device and a corresponding signal within the origin device to a service identification/verification (SIV) feature within the origin device (step S1). In response to the off-hook signal received at the SIV, the SIV initiates an identity authentication process for authenticating the identity of the current caller. First, the SIV provides a prompting instruction to the caller to provide specific identifying information (step S2). It should be mentioned that although the SIV could passively monitor any speech that the caller may utter, it is advantageous to specifically prompt the caller. For example, the SIV may play an audio prompt message asking the caller to APlease say your full name.@ In addition, the prompt may request other identifying information such as a service provider and subject of the call, for example. Further, the central office may trigger a SIV initiation to an IP at other times during a call. The spoken identification information is then received at the origin device

and transferred to the SIV (step S3).

Analysis is performed on the spoken identification information to determine a name of a caller and extract speech characteristics information (step S4). A voice template or other voice pattern information may be stored in the origin device according to a caller identity. In addition, voice template information may be stored at a third party server accessible to the origin device. Preferably, the SIV compares the extracted speech information to the stored pattern information, to identify and authenticate the particular caller. If there is a match between the extracted speech information and the stored pattern information, then a VID signal containing the authenticated identity of the caller is then distributable among multiple devices (step S5).

In addition to authenticating the identity of the caller placing a call, the identity of the device utilized to place the call may be included in a VID. Each origin device may include an identification number that is attached to the VID of a call at the origin device. Alternatively, where a single OE line includes multiple outlets, the device at each outlet may be identified according to the location of the outlet.

Once a VID is returned, then an off-hook signal or change in state of the line is sent to the central office with the VID transferred along the data signal line (step S6). In response to detecting an off-hook signal at the central office, call processing commences. Specifically, the central office assigns a

register to the call and loads information associated with the OE for the off-hook line into the assigned register. In particular, while in the present embodiment the VID and the off-hook signal are transferred concurrently, in alternate embodiments, the off-hook signal to the central office may be detected concurrently with the off-hook signal detected by the origin device SIV.

Receipt of the VID signal at the central office may trigger sending the VID signal to the SCP with a request for a profile (step S7). The SCP may store a profile of telephone services available to a caller according to VID from the PSTN, a telco application server and a generic application server. In addition, the SCP may store other preference and personal information about each caller according to VID. Further, in lieu of, or in addition to the information stored at the SCP, a request may be extended from the PSTN to other servers storing information about a caller according to caller profile, depending on the services to be provided to a caller.

The caller profile for the VID is returned via a data signal to the central office (step S8). The central office then loads profile the services associated with the profile for access by the caller (step S9). The combined caller profile information preferably includes caller specific service information available to the caller from the PSTN or from a telco application server. In addition, the caller profile information may include billing information, enabling billing the caller for each service.

Next, a dial tone is extended to the origin device from the

central office (step S10). While in the present example the dial tone is not extended to the origin device until after a profile is loaded according to a VID, in alternate embodiments, a dial tone may be extended to the origin device after a line subscriber profile for the telephone line is loaded. Then, the individual caller profile accessed according to the VID may replace or supplement the line subscriber profile for the telephone line.

A caller may then input keypad entries to dial digits or may utilize a voice dial feature if available (step S11). The dialed digits are loaded into the assigned register within the central office switch. The central office utilizes the dialed digits and the caller profile to process the call (step S12). In processing the call, the caller VID is preferably forwarded to the destination device for output. In particular, information within the caller VID may be output at the destination device according to preferences designated at the destination device.

The importance of forwarding the caller VID to the destination device is that the callee receives the identity of the caller, not just the line number from which the call is received. Output of a caller VID, including a caller name, device identification, geographic context, and other information, is more advantageous than a typical caller ID that indicates the line number and person billed for the line number because the actual caller is identified, but the actual line number may be blocked from the callee.

If there is not a match of the extracted speech information with the voice templates, then a determination is made as to whether a caller has made more than n tries to speak identification information that has not matched (step S14). If the caller has not made more than n tries, then a prompt is output to the caller to provide another spoken utterance. If the caller has made more than n tries, then a denial message is output to the caller (step S15). In addition, instructions for creating a voice template may be provided or an off-hook signal or change in state of the line without an associated VID may be sent to the central office, such that the caller is enabled to place a call utilizing the services associated with the OE of the line.

According to one advantage of the present invention, where an origin device is a PBX system that manages multiple phone lines, the PBX system often assigns an arbitrary number to calls sent out from the PBX system, such that an employee's phone number cannot be captured. It may be advantageous, by the present invention, to provide the identity of a caller from an employer PBX system. However, employers may not want to disclose the voice templates of employees to a third party system. Therefore, the employee voice templates are stored in association with the origin PBX system that manages employee telephones. In addition, the VID that is transmitted from the PBX system may include a VID that is encrypted only for use by the intermediary for providing services to the employee according to the VID. The VID received by the destination device may only include an identification of the company.

It should be noted that with each transfer of a VID, the central office, the SCP, and the origin device may each record and filter the VID. In particular, filtering the VID may require
5 blocking all or portions of the content of the VID.

With reference now to **Figure 5**, there is depicted a flow diagram of a signal flow and processing where a third party system is accessed by an origin device to authenticate a caller identity in accordance with the method, system, and program of the present invention.

The caller lifts a handset creating an off-hook state in the origin device and a corresponding signal within the origin device requests a network connection to a telco server that performs an identity authentication service (step S20). In particular, the request for a network connection may first transfer to a central office of a switching system that then forwards the call via a network to a telco server. Alternatively, the origin device may
20 also directly access a network, such as the Internet, to connect with the telco server. A secure channel may be established with the request for a network connection.

Next, in response to receiving the off-hook status from the
25 origin device via a network, the telco application server initiates an identity authentication process for authenticating the identity of the current caller. Where the origin device is a wireless telephony device, the off-hook status may be a connection request or other type of signal received at a wireless

network server.

First, an authorization service application provides a prompting instruction to the caller to provide specific identifying information (step S21). For example, the authorization service application may play an audio prompt message asking the caller to APlease say your full name.@ In addition, the prompt may request other identifying information such as a service provider and subject of the call, for example. The spoken identification information is then received at the origin device and transferred via the network to the telco application server (step S22).

Analysis is performed on the spoken identification information to determine a name of a caller and extract speech characteristics information (step S23). A voice template or other voice pattern information may be accessible to the telco application server from a local or remote database management system. Preferably, the authorization service application compares the extracted speech information to the stored pattern information, to identify and authenticate the particular caller. If there is a match between the extracted speech information and the stored pattern information, then a VID signal containing the authenticated identity of the caller is then distributable among multiple devices (step S24).

If there is not a match of the extracted speech information with the voice templates, then a determination is made as to whether a caller has made more than n tries to speak

identification information that has not matched (step S25). If the caller has not made more than n tries, then a prompt is output to the caller to provide another spoken utterance. If the caller has made more than n tries, then a denial message is output to the caller (step S26). In addition, instructions for creating a voice template may be provided or an off-hook signal or change in state of the line without an associated VID may be sent to the central office, such that the caller is enabled to place a call utilizing the services associated with the OE of the line.

Whether the origin device authenticates a caller identity locally or via a third party system, such as a telco application server, the VID of a caller is utilized to specify services provided to the caller. An advantage of authenticating a caller identity via a third party system is that the VID is authorized by a third party system, rather than an origin system that is not as trusted within the network.

In addition, by authenticating a caller identity via a third party system, an origin device that has a large number of potential callers need not store voice templates for all potential callers. For example, where the intermediary device is a private PBX system and the origin device and destination device are office phones, multiple employees may at any time utilize any of the office phones. Rather than storing voice templates at each phone, each office phone used as an origin device may first access a server of voice templates for authentication of a caller identity. Thus, regardless of the phone that a caller employee

uses, the callee employee will receive the identity of the caller, rather than just the extension number from which the caller is calling.

5 However, knowing the extension number of the call may also be advantageous to a callee because the extension number may provide a valuable context for a call. For example, where a first employee is calling a second employee from a bosses extension, the second employee receives the VID of the first employee plus the extension identifier, and thus is prepared for other possible participants to a conversation.

10 In the case of an internal business phone system, it may be advantageous to skip the voice prompt step and just detect a caller providing speech identification information. Employees could then just pick up any phone and speak a full name and any other requested information, dial digits, and be connected to a destination device. In addition, where voice dialing is a feature included in an origin device, it may be advantageous to skip the voice prompt step, such that the caller may enter a seamless speech entry, such as AJohn Doe calling Albert Smith@ and the identity of John Doe would be authenticated and the phone number for Albert Smith retrieved and dialed.

20 It is important to note that while the present invention has been described in the context of a fully functioning data processing system, those of ordinary skill in the art will appreciate that the processes of the present invention are capable of being distributed in the form of a computer readable

medium of instructions and a variety of forms and that the present invention applies equally regardless of the particular type of signal bearing media actually used to carry out the distribution. Examples of computer readable media include
5 recordable-type media, such as a floppy disk, a hard disk drive, a RAM, CD-ROMs, DVD-ROMs, and transmission-type media, such as digital and analog communications links, wired or wireless communications links using transmission forms, such as, for example, radio frequency and light wave transmissions. The
10 computer readable media may take the form of coded formats that are decoded for actual use in a particular data processing system.

While the invention has been particularly shown and described with reference to a preferred embodiment, it will be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope of the invention.